

**CLAIMS**

1. A picture decoding method for decoding coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the method comprising, as a process of inverse quantization:
  - 5 multiplying a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step; and
  - 10 multiplying a product resulted from the multiplication and a quantized value.
2. The picture decoding method according to Claim 1, wherein the multiplication between the quantization matrix and the multiplier is executed for each coded data of a predetermined unit, and
  - 15 the multiplication between the product and the quantized value is executed on a block-by-block basis, the coded data of a predetermined unit including coded blocks, and the product being common to the coded blocks.
  - 20
3. The picture decoding method according to Claim 2, wherein the product resulted from the multiplication between the quantization matrix and the multiplier is stored in a memory,
  - 25 and
  - the multiplication between the product and the quantized value involves reference to the memory.
4. The picture decoding method according to Claim 2,
  - 30 wherein the coded data of a predetermined unit is data that corresponds to a picture.

5. The picture decoding method according to Claim 2,  
wherein the multiplier relates to a normalization factor used  
in a process of inverse orthogonal transformation.

5 6. A picture coding method for coding pictures by orthogonal  
transformation and quantization performed on a block-by-block  
basis, the method comprising, as a process of quantization:

10 multiplying an inverse number of a scaling ratio in a  
quantization matrix and a multiplier, the quantization matrix  
defining a scaling ratio of a quantization step for each component,  
and the multiplier being a coefficient for orthogonal transformation  
or a quantization step; and

15 multiplying a product resulted from the multiplication and a  
value to be quantized.

15

7. The picture coding method according to Claim 6,  
wherein the multiplication between the inverse number of the  
scaling ratio and the multiplier is executed on a predetermined unit  
basis, and

20 the multiplication between the product and a value to be  
quantized is executed on a block-by-block basis, the predetermined  
unit including blocks, and the product being common to the blocks.

25 8. The picture coding method according to Claim 7,  
wherein the product resulted from the multiplication between  
the inverse number of the scaling ratio and the multiplier is stored in  
a memory, and  
the multiplication between the product and a value to be  
quantized involves reference to memory.

30

9. The picture coding method according to Claim 7,  
wherein the predetermined unit corresponds to a picture.

10. The picture coding method according to Claim 7,  
the multiplier relates to a normalization factor used in a  
process of inverse orthogonal transformation.

5

11. A picture decoding apparatus that decodes coded pictures by  
inverse quantization and inverse orthogonal transformation  
performed on a block-by-block basis, the apparatus comprising  
first and second multiplication units operable to perform  
10 inverse quantization,

wherein the first multiplication unit multiplies a quantization  
matrix and a multiplier, the quantization matrix defining a scaling  
ratio of a quantization step for each component, and the multiplier  
being a coefficient for orthogonal transformation or a quantization  
15 step, and

the second multiplication unit multiplies a product resulted  
from the multiplication executed by the first multiplication unit and  
a quantized value.

20 12. A picture coding apparatus that codes pictures by orthogonal  
transformation and quantization performed on a block-by-block  
basis, the apparatus comprising

first and second multiplication units operable to perform  
quantization,

25 wherein the first multiplication unit multiplies an inverse  
number of a scaling ratio in a quantization matrix, and a multiplier,  
the quantization matrix indicating a scaling ratio of a quantization  
step for each component, and the multiplier being a coefficient for  
orthogonal transformation or a quantization step, and

30

the second multiplication unit multiplies a product resulted  
from the multiplication executed by the first multiplication unit and  
a value to be quantized.

13. A program for decoding coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the program causing a computer to execute,  
5 as a process of inverse quantization:

    multiplying a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step; and

10     multiplying a product resulted from the multiplication and a quantized value.

14. A program for coding pictures by orthogonal transformation and quantization performed on a block-by-block basis, the program causing a computer to execute, as a process of quantization:

15     multiplying an inverse number of a scaling ratio in a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation  
20 or a quantization step; and

    multiplying a product resulted from the multiplication and a value to be quantized.

15. A semiconductor apparatus that decodes coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the apparatus comprising

25     first and second multiplication units operable to perform inverse quantization,

30     wherein the first multiplication unit multiplies a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization

step, and

the second multiplication unit multiplies a product resulted from the multiplication and a quantized value.

- 5        16. A semiconductor apparatus that codes pictures by orthogonal transformation and quantization performed on a block-by-block basis, the apparatus comprising  
            first and second multiplication units operable to perform quantization,  
10        wherein the first multiplication unit multiplies an inverse number of a scaling ratio in quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step, and  
15        the second multiplication unit multiplies a product resulted from the multiplication executed by the first multiplication unit and a value to be quantized.